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**UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA**

KEITH ANDREWS, an individual,
TIFFANI ANDREWS, an individual,
BACIU FAMILY LLC, a California
limited liability company, ROBERT
BOYDSTON, an individual, CAPTAIN
JACK'S SANTA BARBARA TOURS,
LLC, a California limited liability
company, MORGAN CASTAGNOLA, an
individual, THE EAGLE FLEET, LLC, a
California limited liability company,
ZACHARY FRAZIER, an individual,
MIKE GANDALL, an individual,
ALEXANDRA B. GEREMIA, as Trustee
for the Alexandra Geremia Family Trust
dated 8/5/1998, JIM GUELKER, an

Case No. 2:15-cv-04113-PSG-JEM

[Consolidated with Case Nos. 2:15-CV-
04573 PSG (JEMx), 2:15-CV-4759 PSG
(JEMx), 2:15-CV-4989 PSG (JEMx),
2:15-CV-05118 PSG (JEMx), 2:15-CV-
07051- PSG (JEMx)]

**REBUTTAL DECLARATION OF
DR. HUNTER S. LENIHAN, PH.D.**

Date: February 27, 2017
Time: 1:30 p.m.
Location: Courtroom 6A
Judge: Hon. Philip S. Gutierrez

individual, JACQUES HABRA, an individual, ISURF, LLC, a California limited liability company, MARK KIRKHART, an individual, MARY KIRKHART, an individual, RICHARD LILYGREN, an individual, HWA HONG MUH, an individual, OCEAN ANGEL IV, LLC, a California limited liability company, PACIFIC RIM FISHERIES, INC., a California corporation, SARAH RATHBONE, an individual, COMMUNITY SEAFOOD LLC, a California limited liability company, SANTA BARBARA UNI, INC., a California corporation, SOUTHERN CAL SEAFOOD, INC., a California corporation, TRACTIDE MARINE CORP., a California corporation, WEI INTERNATIONAL TRADING INC., a California corporation and STEPHEN WILSON, an individual, individually and on behalf of others similarly situated,

Plaintiffs,

v.

PLAINS ALL AMERICAN PIPELINE, L.P., a Delaware limited partnership, PLAINS PIPELINE, L.P., a Texas limited partnership, and JOHN DOES 1 through 10,

Defendants.

1 I, Hunter S. Lenihan, Ph.D., declare as follows:

2 1. I am a Professor of Applied Marine and Fisheries Ecology at the Bren
3 School of Environmental and Science Management at the University of California, Santa
4 Barbara ("UCSB"). The attorneys for the plaintiffs in this case retained me to provide
5 my opinion regarding the likely effects on commercial fisheries from the May 19, 2015
6 oil spill from the Plains All American Pipeline on the Gaviota Coast. This declaration is
7 in response to criticisms made by Plains and its experts in response to the opinions I
8 have expressed in this case.

9 2. Plains' expert, Ann Michelle Morrison, makes a number of criticisms about
10 my BACI/BACIPS analysis of the impact of the oil spill on one lobster fisherman, [REDACTED]
11 [REDACTED]. But as I said at paragraph 31 of my initial declaration, that analysis was merely
12 "an example of the type of analysis I can conduct across fisheries....[u]sing data
13 generated by the fishers themselves and collected by the [California] Department of Fish
14 and Wildlife."

15 3. The kind of analysis that I described in my initial declaration is "designed
16 to account for co-occurring environmental perturbations and conditions, such as ENSO-
17 El Nino events, storms, and other natural anthropogenic disturbances that can influence
18 organisms and fishery catches." *Id.*

19 4. The fishery-wide (classwide) BACI/BACIP analysis I intend to perform in
20 this case will be based on comprehensive data from the California Department of Fish
21 and Wildlife. I have requested and been granted permission by the California
22 Department of Fish and Wildlife to access and use all available fisheries data from the
23 entire southern and central California coast, extending back as far as the data were
24 recorded. I will also receive data provided for fishing seasons after the spill, each year,
25 as they become available. These data include landing receipts data from fisheries for
26 spiny lobster, rock crab, kelletia, black cod, groundfish, rockfish, squid, sea cucumber
27 and sea urchin fisheries. I also plan to survey fishers from these various fisheries and
28 examine and analyze their financial records. My research group has done this

1 successfully with the spiny lobster fishery (e.g., Guenther 2012).

2 5. The Refugio oil spill occurred roughly 18 months ago. In order to conduct a
3 robust analysis I need post-spill fishery wide data from 2015 and 2016, so that I have a
4 minimum of two years of post-spill data to compare to pre-spill data. For those species
5 for which fishing season opens late in the year, only one complete cycle has occurred.
6 For these reasons, I will continue to collect post-spill data as they become available and
7 expect to be able to conduct a robust analysis as of May 2017, after two full years of
8 post-event data becomes available.

9 6. Because Dr. Morrison appears to have misconstrued or misunderstood the
10 point of my BACI analysis, which was merely to provide one example of the kind of
11 analysis I can perform across fisheries once I have the necessary data, her criticisms of
12 my BACI analysis are misplaced.

13 7. First, the transcription errors that I made when I did the analysis of [REDACTED]
14 [REDACTED] catch have been corrected and did not change my opinions about the impact of
15 the spill on [REDACTED] I have reviewed Dr. Morrison's comments regarding additional
16 transcription errors in my corrected analysis of [REDACTED] records and confirmed
17 that, as she acknowledges, those minor errors do not change my conclusion; if anything,
18 they show an even greater impact than shown before. But, again, that is beside the point
19 as I intend to conduct an analysis of the impacted fisheries across those fisheries.

20 8. Second, Dr. Morrison says that I identified the data that I used in my
21 analysis of [REDACTED] as "logbook data" when I actually used "fish ticket" data, but
22 that is an issue of semantics. "Fish ticket" is a colloquial term that usually refers to
23 landing receipts data, which I used in my analysis. There are only a few fisheries,
24 including spiny lobster, squid, sea urchin, and groundfish, that use geographically very
25 specific information of catch and effort recorded in daily logbooks. Lobster logbook data
26 has one of the highest levels of geographic specificity, and thus provides the basis for
27 geographically precise landing receipts data. Thus, information entered into the landing
28 receipts data by lobster fishermen is usually spatially accurate because it is based on

1 logbook records. I equated the logbook-based information used in [REDACTED] landing
2 receipts as “Logbook data”. This had no bearing on the outcome of my analysis. The
3 information that I used for [REDACTED] is the same kind of information I will use for all
4 fisheries: fish ticket data, which is compiled in landing receipt reports and includes
5 information showing the species caught, the amount, and the block from which it was
6 caught.

7 9. Third, Dr. Morrison incorrectly claims that my BACI analysis is invalid
8 because I did not consider potential effects of fishing effort across the impact and control
9 fishing blocks. I did not consider effort because my analysis of one lobster fisherman’s
10 data addressed the question “Did average daily catch vary as a function of space and
11 time space related to the oil spill?” Had the influence of effort been an issue, I would
12 have examined the total number of days fished each season by [REDACTED] in the control
13 and impact areas. This issue can and will be accounted for in my analysis across
14 fisheries once the data are available.

15 10. Fourth, Dr. Morrison says that my BACI analysis of one lobster fisherman’s
16 catch violated the statistical assumptions of additivity and independence. But, again,
17 these are issues that will be addressed when I have more data and am examining the
18 impact of the oil spill across fisheries and over a longer time period. As I explained in
19 paragraph 31 of my initial report, my analysis will examine the possible influence of
20 weather, species biology, and fishing behavior. Alternative models accounting for co-
21 varying factors, such as the model proposed by Dr. Morrison, can be specified and tested
22 in a variety of regression-based models, but only with more fisheries data. (E.g.,
23 Stergiou et al. 1997, cited in paragraph 33 of my initial declaration).

24 11. I presented in my initial declaration a set of physical-biological
25 mechanisms, reported in the published scientific literature, that describe how oil spilled
26 into the marine environment impact fishery organisms through space and time. Of major
27 importance are models that show how spilled oil can leak from sediments and biogenic
28 habitat and kill organisms over periods as long as decades (Peterson et al. 2003

1 regarding the Exxon Valdez oil spill), and other models that show how oil, of different
2 chemical compositions, can cause toxicity to marine larvae at incredibly low
3 concentrations, leading to the probable reduction of their population abundance because
4 the larvae do not develop and grow into adults (Incardona et al. 2012, 2015; Raimondi
5 and Schmitt 1992). This work represents the state of the art in marine oil pollution eco-
6 toxicology, and thus provides important models that explain how oil, at very low
7 concentrations, for even long periods after a spill, can harm fishery organisms.

8 12. A draft U.S. Geological Survey study (Lorenson, *in prep.*) of the May 19,
9 2015 oil spill reinforces the problem of ongoing impacts, concluding that it is “likely
10 that areas will be susceptible to periodic recontamination due to dispersion processes,
11 chemical breakdown reactions, and physical processes such as remobilization and
12 resuspension of sedimentary tar[,]” and that “there are many areas that will not be
13 cleaned and may become persistent sources of hydrocarbons in the marine
14 environment.” Thus, results of the USGS study support models, which I cited in my
15 declaration from the best scientific literature, that reveal how oil spilled into the marine
16 intertidal environment can have long-term, widely-dispersed negative impacts on marine
17 organisms, including those that support fisheries.

18 13. The fact that oil can have dramatic acute negative impacts on organisms
19 from the sizes of larval to adults is accepted without question in the scientific and
20 regulatory communities. That the Plains oil spill killed organisms in the vicinity of the
21 spill is proven and not debated. Whether hydrocarbons released from the Plains pipeline
22 spill also has long-term negative impacts on the set of fisheries in question within the
23 region of the Santa Barbara Channel is highly probable and something that I will
24 continue to analyze. Research of spills of chemically-similar oil, in a wide variety of
25 environments, some not very different from Refugio Beach, have been conducted and
26 have shown to negatively impact fisheries, as I explained in my initial declaration.

27 14. The hypothesis that some southern and south-central California fisheries
28 were negatively impacted by the Plain’s oil spill because of the acute death of organisms

1 in the vicinity of the spill is testable and well-supported by recent published literature.
2 Many oil spills have occurred and been studied since the 1969 Santa Barbara oil spill,
3 when scientists limited their impact assessment to short term negative impacts. More
4 recent research has shown the longer term, chronic effects of oil spills on a host of
5 marine populations.

6 15. Based on my professional experience, I am well aware of the step-by-step,
7 logical, and rigorous approach required to identify the negative impacts of
8 environmental perturbations on marine fish and other organisms. Descriptions of the
9 weight of evidence needed to accurately assess a negative environmental impact are laid
10 out in detail in the book written by my colleagues R. Schmitt and C. Osenberg (1996),
11 which I cited in my declaration as well as use each winter in my Applied Marine
12 Ecology course at UCSB. I have also published dozens of papers on the subject of
13 marine ecological field assessments in peer-reviewed scientific literature.

14 16. Dr. Morrison also has experience assessing the impact of oil and other
15 perturbations in aquatic ecosystems, but she has far less experience in publishing
16 rigorous, peer-reviewed science in general, having only three papers in peer-reviewed
17 scientific journals. The bulk the publications listed in her CV are non-peer reviewed
18 abstracts (9 of 14 total publications). The remainder of her body of work is grey
19 literature reports that are non-peer reviewed. Of the three peer-reviewed journal articles,
20 one is a review article of marine pollution that does not include original empirical or
21 quantitative science (Mearns et al. 2016); one reports on laboratory toxicity tests and
22 modeling of freshwater zebrafish (a widely used model lab organism) (Morrison et al.
23 2014); and the last (Morrison et al. 2003) reports on the performance of curve analysis of
24 beach water quality data that was collected in the study.

25 17. The body of Dr. Morrison's scholarship concerning field impact assessment
26 is minimal, the result of which is an incomplete understanding of oil spill impact on
27 marine species and my proposed damage assessment.

28 18. A list of additional materials considered is attached as Exhibit A.

1 I declare under penalty of perjury that the foregoing is true and correct.

2 Executed on December 20, 2016 at Santa Barbara, California.

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6 Hunter S. Lenihan, Ph.D.
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